

Message

From: Ohl, Matthew [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5BDE479F1AB54A9EBC9541A7D452C3B7-MOHL]
Sent: 6/29/2021 5:38:23 PM
To: Clabaugh, William B CIV USARMY CELRL (USA) [William.B.Clabaugh@usace.army.mil]
CC: Knox, Corey S CIV (USA) [Corey.S.Knox@usace.army.mil]; dave.j.becker@usace.army.mil

Non-Responsive

Matthew J. Ohl
Remedial Project Manager
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From: Julie Konzuk <JKonzuk@Geosyntec.com>
Sent: Tuesday, June 29, 2021 11:25 AM
To: Ohl, Matthew <ohl.matthew@epa.gov>
Cc: dave.j.becker@usace.army.mil; corey.s.knox@usace.army.mil; Andrew A Gremos <agremos@ramboll.com>; Norman Bernstein <nwbernstein@nwblc.com>; pracher@psrb.com; Gary Wealthall <GWealthall@Geosyntec.com>; Krueger, Thomas <krueger.thomas@epa.gov>; DPetroff <DPetroff@idem.IN.gov>; Clabaugh, William B CIV USARMY CELRL (USA) <William.B.Clabaugh@usace.army.mil>
Subject: RE: Review of the Memorandum summarizing chemical oxidation treatment of the DNAPL Cell on Third Site and comparison to bioremediation case studies and plan

Matt,

Please find attached a response to your comments below. Please let us know if you have any issues with the file.

Regards,

Julie

Julie Konzuk, Ph.D., P.Eng. (ON)
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From: Ohl, Matthew <ohl.matthew@epa.gov>

Sent: Wednesday, June 2, 2021 2:59 PM

To: Julie Konzuk <JKonzuk@Geosyntec.com>

Cc: dave.j.becker@usace.army.mil; corey.s.knox@usace.army.mil; Andrew A Gremos <agremos@ramboll.com>; Norman Bernstein <nwbernstein@nwbllc.com>; pracher@psrb.com; Gary Wealthall <GWealthall@Geosyntec.com>; Krueger, Thomas <krueger.thomas@epa.gov>; DPetroff <DPetroff@idem.IN.gov>; Clabaugh, William B CIV USARMY CELRL (USA) <William.B.Clabaugh@usace.army.mil>

Subject: Review of the Memorandum summarizing chemical oxidation treatment of the DNAPL Cell on Third Site and comparison to bioremediation case studies and plan

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Good afternoon Julie,

We have reviewed the above-referenced memorandum and understand the potential benefits of bioremediation; however, further thermal treatment still appears to be more promising than the proposed injections alone. Case studies where emulsified vegetable oil was successfully applied after treating soils with ERH and/or other thermal treatment may be helpful for further review.

If the PRPs want to propose the injections after further thermal treatment is completed, the following USACE comments are expected to be helpful.

General Comments:

- A) It is agreed from the information provided that the previous ISCO was conducted in a way that failed to allow adequate contact with the contaminants. The memo does not address the potential for an inadequate mass of oxidant to have been delivered to fully address the contaminant mass present, even if delivery had been successful. This should be identified as a potential contributing factor that was not quantitatively evaluated.
- B) There is very limited flow that occurs within the sheet pile barrier and this also limits the ability to distribute even persistent amendments away from the injection points. This should also be noted and considered in the approach to any future delivery of amendment within the cell.
- C) The very high injection pressures (hundreds of psi) previously used for the calcium peroxide (RegenOx) undoubtedly fractured the soil. Without knowing the fracture propagation, it is not possible to know where the amendment actually went. More careful, controlled development of fractures, possibly with the placement of sand proppant and the construction of wells intersecting these fractures, would allow good distribution of amendments. This has been done for bioremediation in tight silty clays at similar sites where concentrations of TCE/DCE/VC in the 100,000s of ug/L have been successfully reduced in many nearby wells by 60-99%. This should be considered for any future attempt.
- D) We recommend consideration of the use of electrokinetics to deliver soluble carbon sources to treat the tills. More information can be found in the IRTC training discussion on injection optimization presented by Suzanne O'Hara.

- Page 4: Please note that natural biosurfactants produced by bacteria can also enhance dissolution of the NAPL.
- Page 5: It should be noted that the overburden pressure at 10 feet is only around 8 psi, so even modest pressure can cause soil fracturing at the depths described.

- Page 5: The text notes that carbon sources for bioremediation can persist longer than oxidants. This is true, but the 30-day lifespan for the oxidant noted in the text is not necessarily representative of the lifespan of permanganate (or even persulfate) that can persist for months in the absence of organics, allowing them to diffuse into low permeability zones and react with contaminants there.

Thank you,

Matt

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From: Julie Konzuk <JKonzuk@Geosyntec.com>
Sent: Monday, April 12, 2021 8:24 PM
To: Ohl, Matthew <ohl.matthew@epa.gov>
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Subject: Memorandum summarizing chemical oxidation treatment of the DNAPL Cell on Third Site and comparison to
bioremediation case studies and plan

Matt,

Please find attached a memorandum summarizing our understanding of the chemical oxidation (OXY) treatment of the DNAPL Cell, including the approach taken and the outcome of each injection phase. We have also provided some case study examples where we have implemented bioremediation in similar site conditions. We have also included some discussion regarding how our plan was developed to overcome the challenges experienced during the OXY injections. Please let us know if you have any questions or concerns.

Regards,

Julie

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